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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|------------------------|-------------|----------------------|---------------------|------------------|
| 10/644,643 | 08/20/2003 | Jian Wang | 02-40181-US | 5489 |
| 7066 | 7590 | 06/29/2004 | | EXAMINER |
| REED SMITH LLP | | | | CURTIS, CRAIG |
| 2500 ONE LIBERTY PLACE | | | ART UNIT | PAPER NUMBER |
| 1650 MARKET STREET | | | | |
| PHILADELPHIA, PA 19103 | | | 2872 | |

DATE MAILED: 06/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/644,643 | WANG ET AL. | |
| | Examiner | Art Unit | |
| | Craig Curtis | 2872 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-39 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-39 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perkins et al. (6,288,840) in view of Garvin et al. (4,289,381).

With regard to claim 1, Perkins et al. disclose the invention as claimed—[a] radiation polarizer (see wire grid polarizer 10 in Fig. 8), comprising:
a substrate (1 or 3);
nanostructures (5); and
a groove layer (see gaps 7), wherein a communicative coupling between said groove layer and said nanostructures polarizes the radiation (cf. ray of light 9, which has both orthogonal electric field polarization states S & P, with ray of light 13, which is solely P-state light), said radiation having an electric field orthogonal to said groove layer being a necessary condition, and wherein said radiation has a wavelength in the range of about 250 nm to less than about a microwave wavelength (a range that encompasses the visible portion of the electromagnetic spectrum (viz., 400 nm to 700 nm), in which range the polarizer of Perkins et al. was designed to operate)—EXCEPT FOR explicit teachings of the following additionally recited claim limitations:

wherein at least one anti-reflection coating layer is communicatively coupled to said substrate;

wherein said radiation polarizer comprises at least two of said nanostructures and at least two of said groove layers;

wherein each of said at least two groove layers is interstitial to a respective one of said at least two nanostructures.

Garvin et al., however, disclose a radiation polarizer (see Fig. 7) having at least one anti-reflection coating layer (34, 36) communicatively coupled to a substrate (30); at least two nanostructures (20 & 22) and at least two groove layers; and wherein each of said at least two groove layers is interstitial to a respective one of said at least two nanostructures (see gaps 56 between nanostructures 20, & gaps 72, 74, 76, etc., between nanostructures 22). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the invention of Perkins et al. such that it further comprise at least one anti-reflection coating layer is communicatively coupled to said substrate, at least two of both said nanostructures and said groove layers, wherein each of said at least two groove layers is interstitial to a respective one of said at least two nanostructures, as taught by Garvin et al., for at least the purpose of achieving optimal polarization discrimination (trans. selectivity), while at the same time maximizing throughput (alt. minimizing reflection losses) of incident radiation due to the presence of said at least one anti-reflection coating layer.

With regard to claim 2, the groove layer taught by Perkins et al. comprises grooves. See 7.

With regard to claims 3 & 4, please see Fig. 8 of Garvin et al.

With regard to claim 5, please see col. 6, ll. 47-52 in Perkins et al.

With regard to claim 6, the combination meets this teaching if the structures originally referred to as nanostructures are instead referred to as grooves, and vice versa.

With regard to claim 7, air has a lower conductivity than metals. See col. 6, ll. 63-66 in Perkins et al.

With regard to claim 8, nanostructures 20 and 22 taught by Garvin et al. are not disclosed as being identical.

With regard to claim 9, please see col. 6, ll. 63-66 in Perkins et al.

With regard to claim 10, col. 6, ll. 66-67—col. 7, ll. 1-15 in Perkins et al.

With regard to claims 11-21, please see the teachings of the limitations respectively recited in these claims, as set out in the text and figures of the references of the combination.

With regard to claims 33-39, please refer to the teachings by the combination of the subject matter disclosed in these claims, as set forth hereinbefore.

With regard to claims 22-32, the structural teachings of the claimed invention by the combination, as set forth hereinbefore, are deemed to have met, by straightforward extension thereof, the method step teachings recited in these claims.

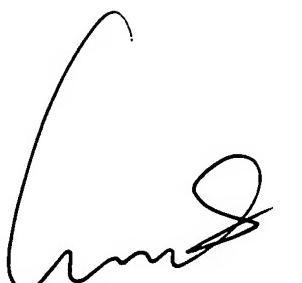
Contact Information

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig Curtis whose telephone number is (571) 272-2311. The examiner can normally be reached on Monday-Friday, 9:00 A.M. to 6:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A. Dunn can be reached on (703) 308-1687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C.H.C
Craig H. Curtis
Group Art Unit 2872
25 June 2004



Audrey Chang
Primary Examiner
Technology Center 2800